



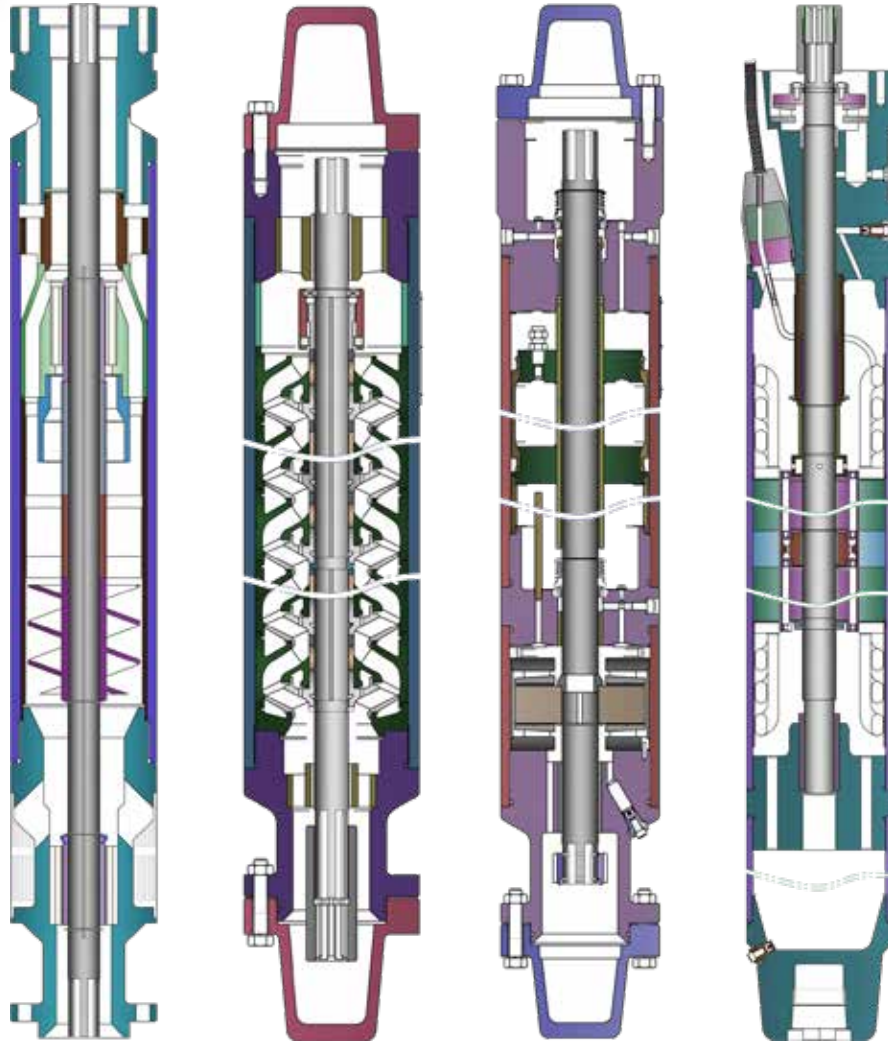
# **NOVA PETROLEUM**

S E R V I C E S

**ARTIFICIAL LIFTING SYSTEM  
GIVES YOU THE BEST IN THE FIELD**

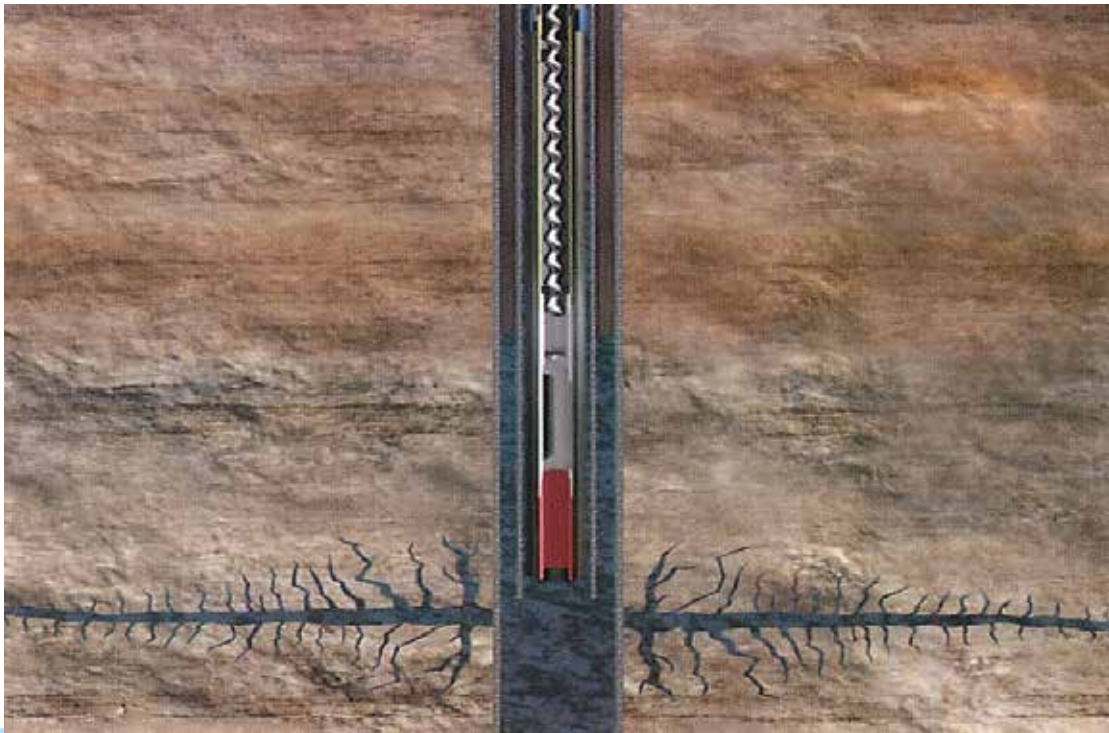
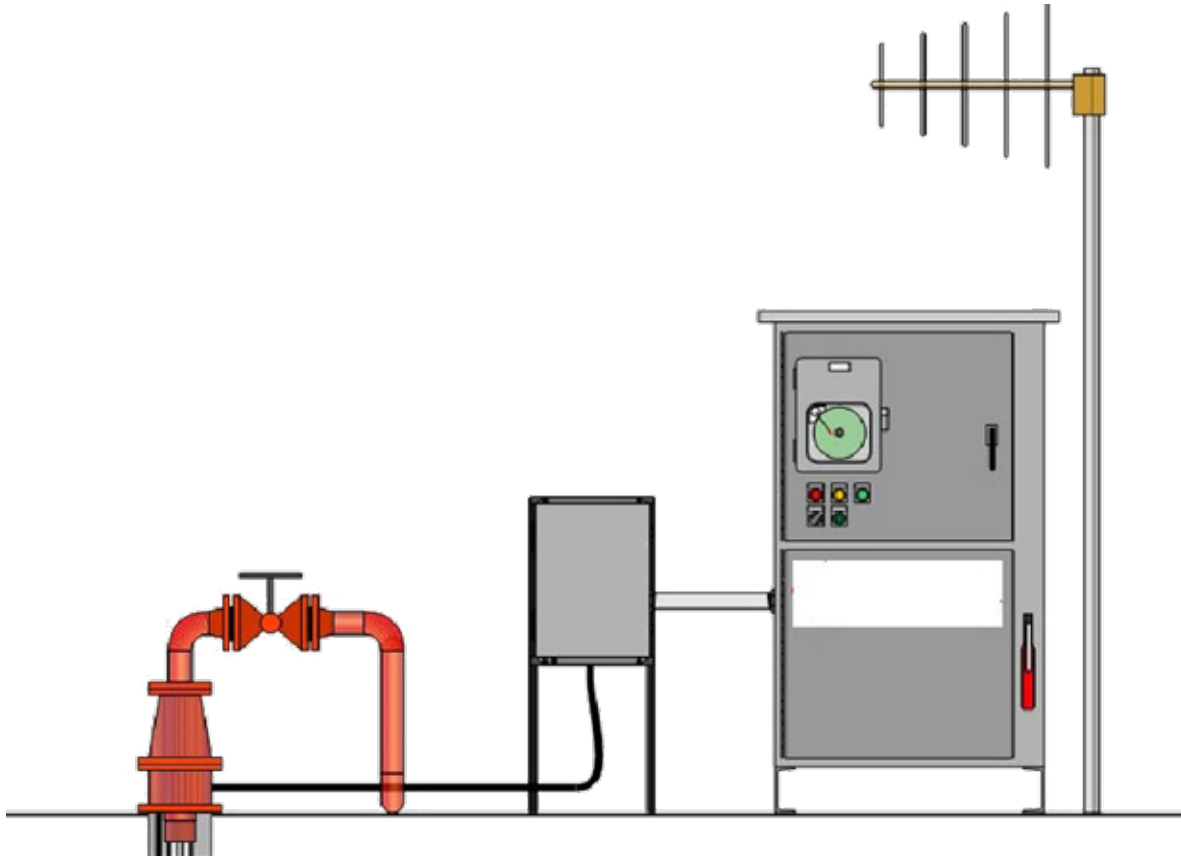


ELECTRIC SUB-  
MERSIBLE PUMP



# NOVA ARTIFICIAL LIFTING SYSTEM

PROGRESSIVE  
CAVITY PUMP



## SUCKER ROD PUMP





**NOVA** is a brand name of the American Manufacturers of Artificial lifting system. It is made to world-class precision engineering and manufacturing standards. The company has more than twenty years' experience in manufacturing Artificial lifting system and spare parts and engineering products to serve various types of industries related to the oil industry and it is exported to many countries around the world.

Our philosophy is to provide unparalleled service, quality and cost-effective products and distinguished technology features that enhance performance.

In the petroleum industry, success is measured by performance. Our focus is on the pursuit of innovation in the application of Electric Submersible Pumps and also the surface systems.

Our developed high efficiency pumps and motors offer material options to control high abrasion and resist corrosion. With advanced downhole and surface monitoring capabilities and improved operating temperatures, our pumps can meet and exceed client requirements.

We also manufacture horizontal pumping systems, having low maintenance requirements provides an excellent alternative for use in water injection applications where high pressure fluids are required.

Our QA team works hard to maintain first class reputation with international standards such as ISO9001, ISO/TS 29001-2000 and we apply API standards in all our testing facilities.



# NOVA ALS GIVES YOU THE BEST IN THE FIELD



Quality, reliability, efficiency, and services. NOVA commitment to building submersible pumping systems that stay downhole longer at less overall cost to our customers.

## **QUALITY**

NOVA products routinely establish the highest quality standards in the industry.

## **RELIABILITY**

Every day, NOVA equipment is running in some of the most challenging applications in the world. Sand, H<sub>2</sub>S, CO<sub>2</sub>, and high temperatures are just a few of the extreme conditions that NOVA equipment has measured.

## **EFFICIENCY**

Higher efficiency equates to lower cost. NOVA motors and pumps combine to make the most efficient systems in the industry.

## **SERVICES**

The employees of NOVA are dedicated to designing, manufacturing, and servicing extreme-duty submersible pumping systems that outperform our customer's expectations. Quality and reliability are built into every product in modern facilities.

## **TESTING 100 % BEFORE DELIVERY**

The use of High-Quality raw materials is fundamental to us, ensuring the final products are produced to the highest standards.

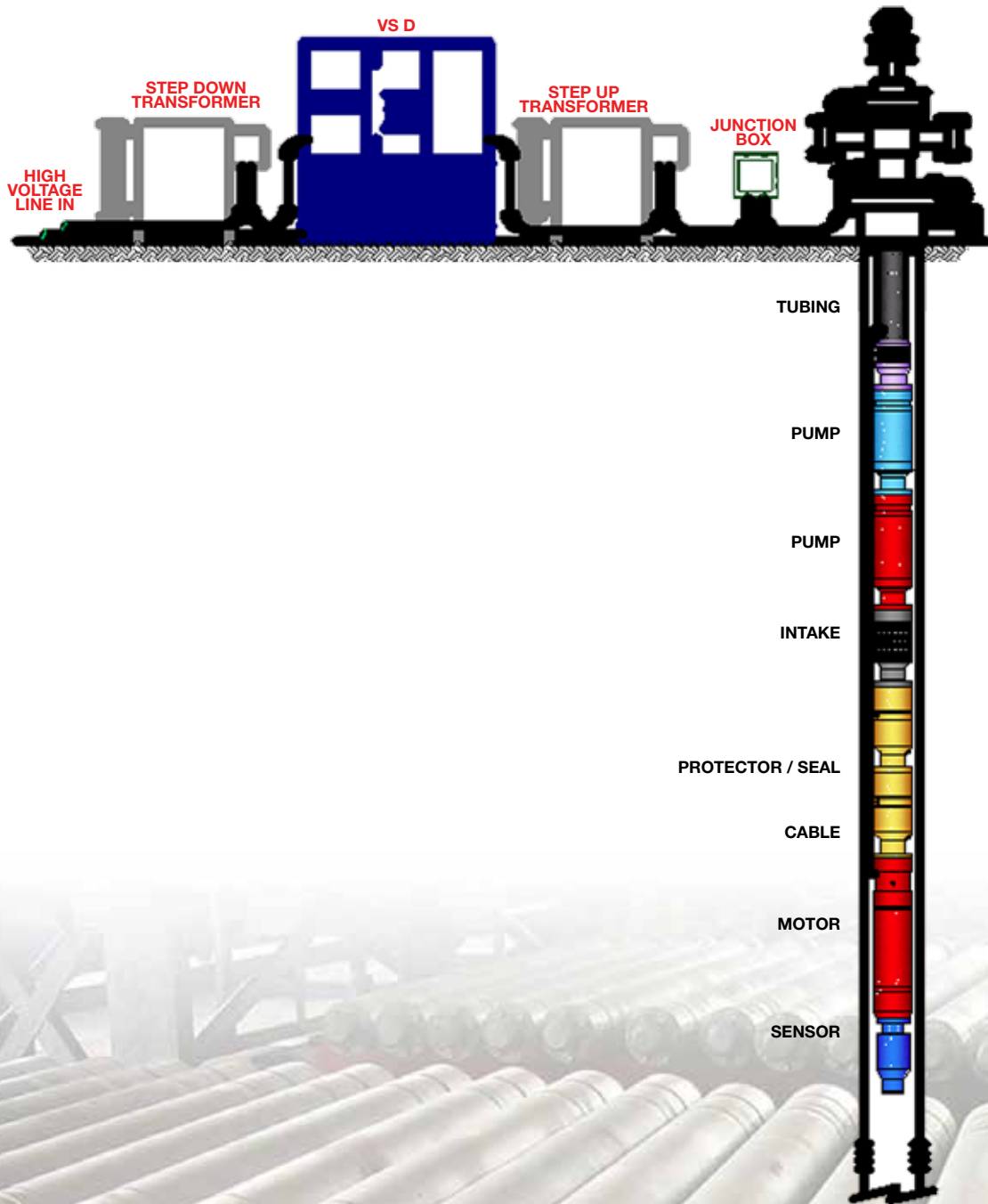
The principles of Quality management are the foundation of our business. The documented quality management system has been fully implemented and conforms to ISO 9001. With a team of highly skilled utilizing a diverse range of measuring equipment, we ensure the final products meet the individual requirements of our customers.



WE ARE COMMITTED  
TO OUR CUSTOMERS

## General ESP Layout

GENERAL ESP LAYOUT WITH  
VARIABLE SPEED DRIVE





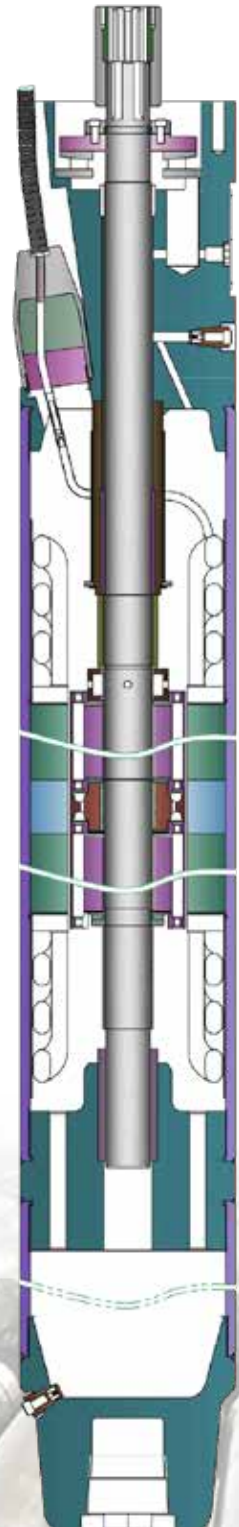
# NOVA MOTORS: RELIABILITY

Our innovative approach to Motor design has made the NOVA the most efficient and robust in the industry. This efficiency translates into significant power cost saving and more predictable operations for you.

NOVA is two pole, squirrel-cage, induction motors are manufactured in a variety of horsepower ratings, operating voltages and currents to meet extremes in pressure and temperature requirement. Motor sizes are available at 375, 456, 540 and 562 series. Factory Vacuum filled with high dielectric mineral oil before leave to filed.

Improved motor durability in mechanical and insulation systems provides longerrun life. High-Efficiency design enabled by increased copper content, shaped rotor bar, and long rotor design that reduces operating costs.

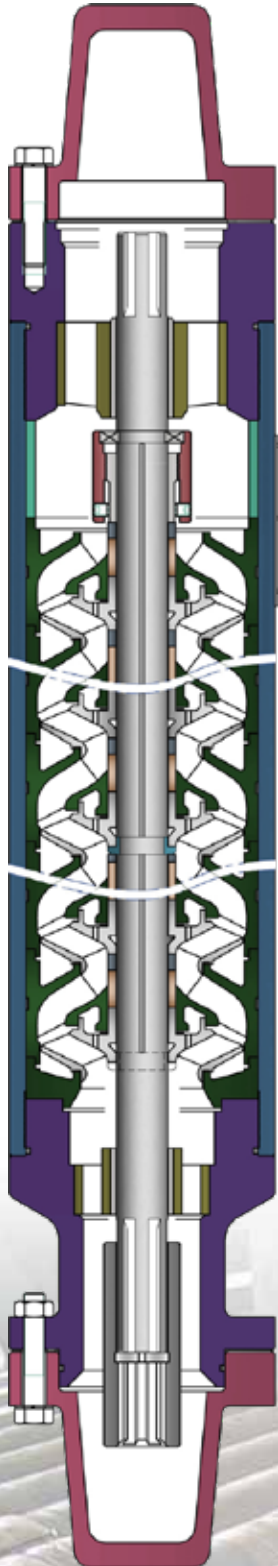
Fewer mechanical and electrical losses, resulting in cooler operating temperatures - thus achieving better reliability and run life, and minimizing the need to oversize motors.







## NOVA PUMPS, EFFICIENCY ADVANTAGE



The efficiency of NOVA pumps has set the industry's standard. Compare our pump's performance curves with any other submersible vendor's you will see clearly the NOVA efficiency advantage.

NOVA multistage centrifugal submersible pumps consist of a rotating impeller and a stationary diffuser that can be stacked in either floater or compression configurations to meet the most demanding performance requirements. Corrosion resistant impellers and diffusers are cast from a Ni resist high-nickel iron containing destructive-resistant properties. For more sever environments optional radially stabilized corrosion- resistant pump materials, including various stage coatings and boron diffusion hardening processes are available.

All NOVA pumps are performance tested to API RP 112S standard with ISO 9001 quality standard in computerized test facility before shipping to confirm efficient down hole operation.

We provide the pumps from 70 Bbls/d up to 35000 Bbl/d. Operating depths up to 14000 feet, in 338, 400, 513, 538, 562, 675, 875, and 1025 series.

# NOVA PROTECTORS / SEALS, THE BEST CHOICE



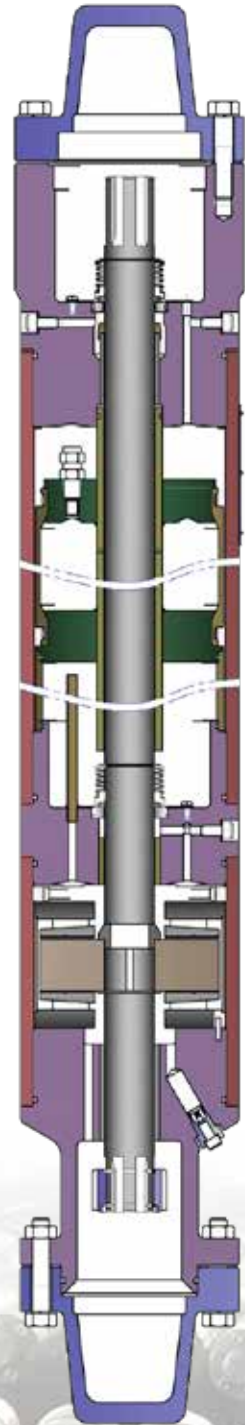
Through consideration of problems associated with down hole environments, combined with a positive barrier to well fluids, makes the NOVA protector the best choice in seal chambers for long submersible motor run life.

The Protector located between the motor and the intake and performs the following functions:

- **Houses the thrust bearing that carries the axial thrust developed by the pump.**
- **Isolated and protects the motor from well fluids.**
- **Equalizes the pressure in the well bore with pressure inside the motor.**
- **Compensates for the expansion and contraction of motor oil due to temperature changes in the motor.**
- **Pump to motor mechanical connection.**

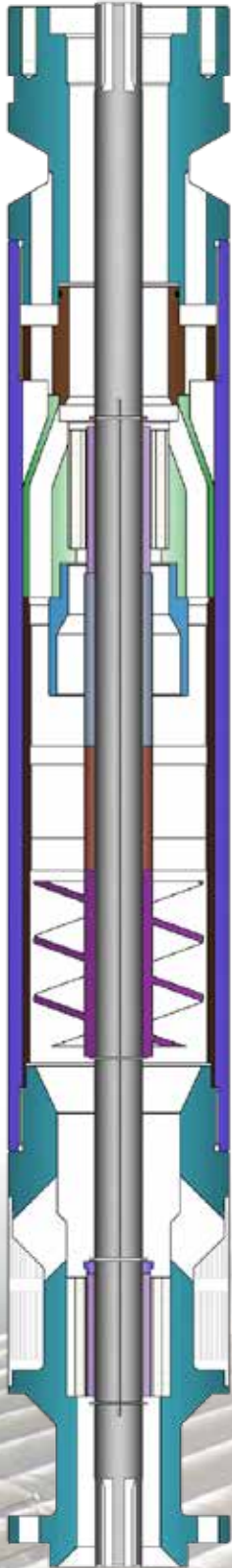
Protectors can be used in tandem configurations for increased motor protection. They are available in both bag type and labyrinth style designs to meet specific applications. High load thrust bearings and high temperature elastomers available in all models as well as corrosion resistant housing and flam spray coating optional.

NOVA provide the protectors in 375, 400, 540 in different configuration SB, DB labyrinth and modular.





## GAS SEPARATOR / INTAKE THOUGH PERFORMANCE



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# NOVA CONTROL PANEL - FIX SPEED

NOVA Switchboards are built to the highest standards so you receive years of uninterrupted reliable service. It is adaptable to any current motor control system now available. Five types available 600, 1500, 2500, 3300, 5000 Volts.

## The Switchboards Specifications:

- NEMA 3 / 3R, dust / rainproof 12 gauge steel
- Five mill powder coat finish NEMA 4 pilot devices
- 600 / 1500 / 2500 / 3300 / 5000 V 160 / 200 Amps
- 4400 Amps Interrupting Capacity
- Load Break Disconnect
- Vacuum Contactor
- 1 – 1 KVA Multitap Control Transformer
- 2 – 25 VA Multitap Instrument Transformer
- 75 / 100 / 150 / 200 : 5 Current Transformers
- Bristol Babcock Amp Chart recorder
- Lightning Arrestor
- Superior Ground Path
- Separate Cable junction Box Separate low voltage instrument Box incoming and outgoing cable support
- Other specifications are available as per request





## NOVA VARIABLE SPEED DRIVE - TOTAL FLEXIBILITY

When changing reservoir conditions are the problem, look to NOVA Variable Speed Drive for the solution. Built for any environment, from the desert heat and dust to cold and rain, NOVA Variable Speed Drive gives consistent, dependable year-round service.

A simple adjustment of the frequency setting varies flow rate and pump discharge pressure to match your changing reservoir conditions, eliminating costly system change-outs over the life of the well.

The packages are available in low Voltage 380-690 V, as in medium Voltage, 2300 -4160 Volt configurations.



Packages are fully customized to meet customer specifications to operate onshore or offshore in any conditions.

Packaged units are available with stand-alone NEMA 3/4 enclosures to fully functional control room packages housed in custom electrical house type modules on skid bases.

# NOVA VARIABLE SPEED DRIVE - TOTAL FLEXIBILITY - cont.

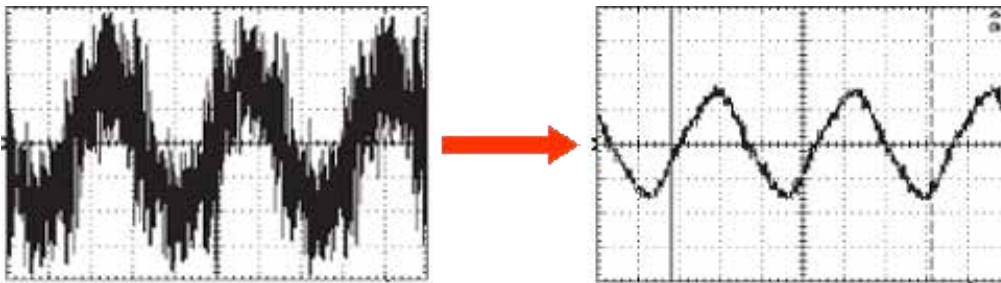


Low voltage Variable speed drives are voltage source DC link converters with IGBT inverters. This package is now the industry's standard with the phasing out of VVI type six-step drives.

Medium Voltage Variable speed drives are available in either voltage source or current source type drives.

NOVA understands line and load side harmonic problems.

Lineside solutions rang from trap and linear type harmonic filters to multi-pulse converter sections utilizing 12, 18, and 24 pulse configurations.



Trap or notch type filters, typically referred to as 5th, 7th, 11th, and 13th, harmonic filters are used when source impedance conditions are known and will not change over time. Linear type harmonic filters remove harmonics above the 4.3 harmonic and are used when source impedances are unknown and when the Variable speed drives are loaded near full load. If site conditions vary along with the load conditions, then multi – pulse converter sections for fully active front end technology to reduce the harmonic content that feeds back to the power source, allowing each installation to meet IEEE 519 1992 guidelines.

To provide power for 12 and 18 pulse Variable speed drive, NOVA can provide custom-built dual polygon transformers that are reconfigurable to work in a bypass condition for direct online switchboard applications. Source transformers can also be supplied with tertiary windings to provide site power for additional loads such as site lighting or chemical injection pumps.



## NOVA VARIABLE SPEED DRIVE - TOTAL FLEXIBILITY - con.

Pulse Width Modulated ( PWM) Variable Speed drives produce harmonics centered on their carrier frequencies and multiples. The use of PWM Variable Speed drive's in ESP applications gives way to resonant conditions that allow the carrier frequency or one of its multiples to amplify the voltage seen at the motor at magnitudes that will quickly damage the motor or the cable supplying it. NOVA can provide load-side filtering for ESP applications that will eliminate load-side harmonics being applied to the motor or the cable, in turn delivering an accurate sinusoidal voltage waveform to the ESP. Run life is significantly improved in these applications.



NOVA Variable speed drives packages to use Transient voltage surge suppressor devices (TVSS). All TVSS devices are not created equal, and most employ multiple metal oxide varistors soldered together to form a single protective block. The problem with this type of device is it is subject to the skill of the assembler to provide paths of equal impedance to each device soldered into the array. This isn't easy to do. Moreover, each MOV is not identical to all others in the variety, which means that the car fails prematurely, producing a cascading, catastrophic failure of all the other devices in the display. NOVA utilizes single MOV devices assembled in a non-destructive package, and this allows mounted inside of Variable speed drive without the use of additional protective fuse or circuit breakers.

# NOVA POWER CABLE AND ACCESSORIES



## **POWER CABLE**

Power Cable are offered in AWG sizes from #6 to #1 and with Galvanized or Monel armor. Stainless steel Armor or double armor also available on special order.

Selection of power cable is based on well conditions such as temperature, gas, and pressure.

NOVA selection offers multiple types of cable specially designed to perform reliably in well conditions and harsh environments normally found in submersible operations.

## **TRANSFORMERS**

Regardless of transformer - primary voltage, National – ESP can provide the transformers to meet the requirements of any cable and motor, Any step – up or step down in different KVA.

## **VENT JUNCTION BOX**

Recommended for all Submersible installations, this product protects the control panel from gas migration from the well. As a point of connection for down hole cable to surface cable, the vented junction box makes safety and installation easy.

## **CHECK VALVE**

When a down hole submersible shuts down, the fluid in the tubing string falls back through the pump, causing the Pump shaft to backspin.

A broken shaft can result if the control panel is not set properly and the unit restarts while the pump is in backspin. A check valve installed in the tubing beneath the drain valve protects your investment by holding the liquid in the tubing and preventing the pump from going into backspin.

## **DRAIN VALVE**

Pulling a wet string of tubing can increase rig time and cause hazardous working conditions. The drain plug, contained in the drain valve and placed two or more tubing joints above the pump, can be served. When a bar is dropped from the surface, all liquid is released within the tubing.

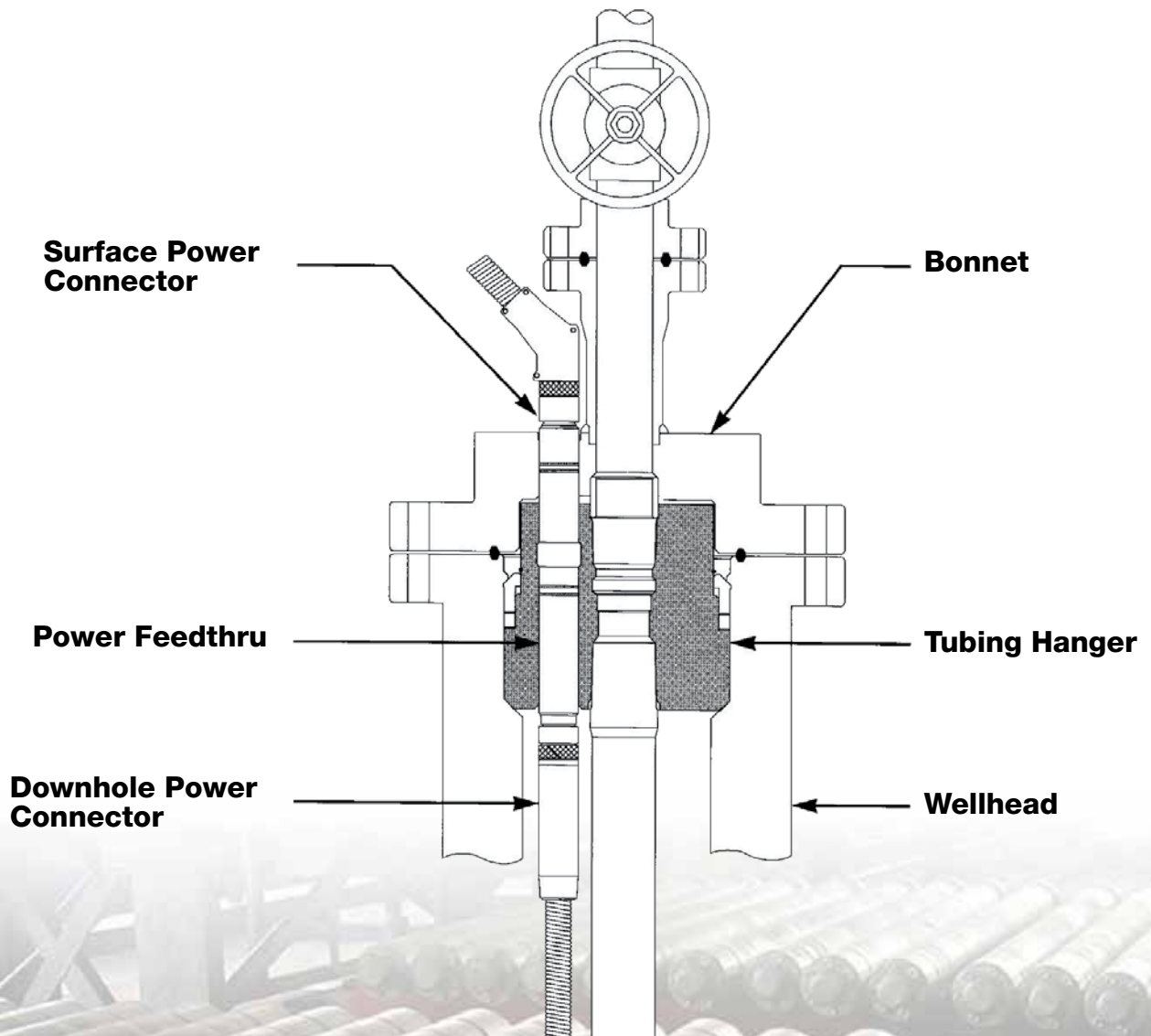




# NOVA POWER CABLE AND ACCESSORIES

## TUBING HEAD

Tubing Head Built specially for submersible pumping applications; these heavy-duty steel tubing heads give consistently dependable service. NOVA has the product, whether the application requires mandrels or pigtails or sealing and support for cable and tubing.



# NOVA DOWN HOLE SENSORS



Application of ESP Sensor is a concept of measuring down hole parameters for optimization and Automation. The tools intend to data logging and transmission to external devices of current value of :

- Temperature of ESP Motor Oil
- Intake Pressure
- Rate of Vibration

Flow meter as well intends to measure the outlet pressure as well

NOVA Down hole Sensor units are transmit data via Main Cable treated in surface unit and transmitted into controller. Data on pressure, temperature, vibration speed values are stored in memory and induced on display of the switchboard's controller and with the help of software could be examined in table or graphic mode on computer's display or transmitted to the telemechanics system via interface the RS-485 (ModBus protocol).

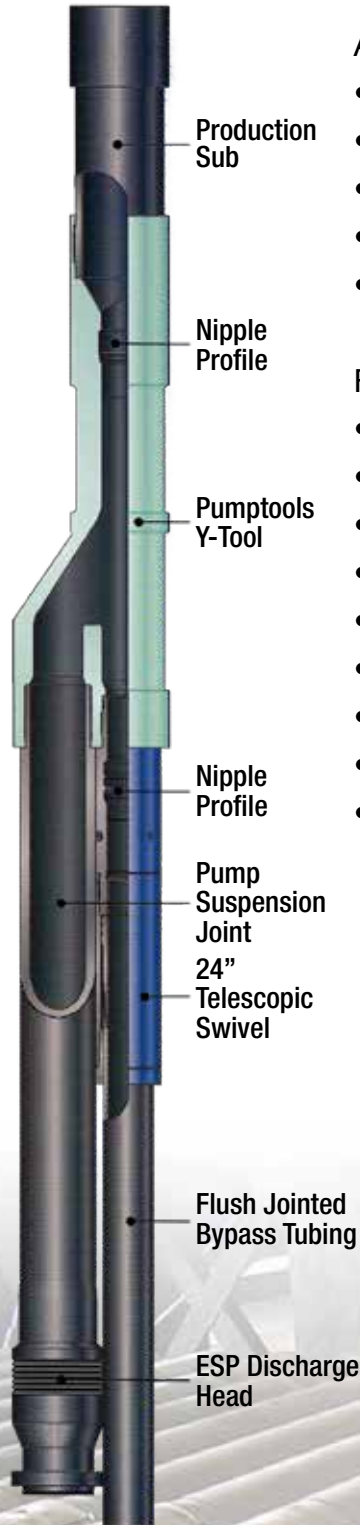
## SPECIFICATION

Specification	Specification
Pressure, MPA	0...25, 32, 60
Down hole Temperature Sensor C	0-150
Temperature of remote Sensor C	0-300
Vibration along X-Y and Z axes, g	0-30
Down hole unit C	0-150
Surface unit	-60 to +50





# NOVA Y- TOOLS



Applications include:

- Production logging
- Through Tubing Perforation
- Coiled Tubing Operations
- Well Intervention under Dynamic Conditions
- Operation of Flow Valves below ESP

Features

- Fast Stroke Telescopic Adjustable Union
- High Quality Cast Y Tool with Smooth Flow precision machining
- Nipple Profiles to securely land and lock system tools
- Fast Stroke Telescopic Swivel Joint
- Rugged Neck Flange Bypass Tubing Clamps
- Materials to NACE specification
- All tubing and thread sizes available
- Full range of accessories
- Centralizer fins on all external components

# NOVA SURFACE PUMPING SYSTEMS



## HORIZONTAL PUMP

Since the launch of the Horizontal pumping system, NOVA has proved to be a cost-effective alternative to split case, vertical turbine, and positive displacement pump designs in many applications.

The Horizontal Injection System is available in various sizes with discharge rates from 700 bpd to 65,000 bpd and discharges pressures up to 4320 PSI. Higher discharge pressures are available upon request. They can also be installed in parallel for large volumes and for protection from total system shutdown.

The Horizontal Injection System is a standard manifold that is typically limited to a maximum pressure of approximately 200 PSI. However, higher pressure intake manifold pressures in the range of 0 to 3,000 PSI are available upon request. There is also a minimum suction pressure limitation required to prevent cavitation, depending on pump design

The horizontal injection system is a high volume, high-pressure pump ideally suited for use in waterflood operations, in transfer wells, and as a pipeline booster pump. It moves fluid with a standard centrifugal pump, driven by a standard class A or B electric motor, through a specially designed thrust chamber. There is no crankcase, or plunger because the pump section and fluid seal are cooled by the pumped fluid itself.

These pre-packaged units are provided as a whole system from a single-source vendor and delivered pre-assembled to the site. The modular design of factory-aligned components permits easy maintenance and minimal downtime when maintenance is required. All major components can be exchanged within 2 or 3 hours, and the exception of the motor, will not require realignment before the pump is started.

NOVA Trouble-free service requires no daily maintenance. There are no V-belts or packing to service, and a typical routine maintenance schedule is a quarterly lubricant change and component check. Quiet, smooth-running performance extends equipment life and greater the chance of leakage from associated piping. Quiet Operation makes the Horizontal Pumping system an ideal for urban and environmentally sensitive locations.

## APPLICATIONS

1. Reservoir Pressure maintenance
2. Saltwater disposal and waterflood
3. Crude Transfer
4. Pipeline booster service
5. Testing service transfer
6. Mine dewatering
7. CO2 Booster service
8. Power fluid booster for the hydraulic lift system
9. Natural Gas Liquids ( NGL) Booster Services
10. Lean Amine circulation
11. Fracturing for coal bed methane



# NOVA SURFACE PUMPING SYSTEMS



## NOVA FIELD SERVICES AND TESTING

### **FIELD SERVICE FOR INSTALLATION, PULLING AND TROUBLE SHOOTING**

NOVA products and systems are supported by experienced services personnel who assist in equipment installation, change out and system optimization on all ESP, PCP and SRP.

Our service technicians are thoroughly trained on all brands of Artificial Lifting system equipment

### **EQUIPMENT TESTING CABLE SPOOLING**

NOVA is providing cable spooling and banding services during installation and pulling.

NOVA test facility offers to test all the equipment (Motor, Pumps, Protectors, Cables) with latest recommended practices and standards for API and IEEE.



**NOVA PETROLEUM**  
S E R V I C E S

# **NOVA ARTIFICIAL LIFTING SYSTEM**

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# **PROGRESSIVE CAVITY PUMP**



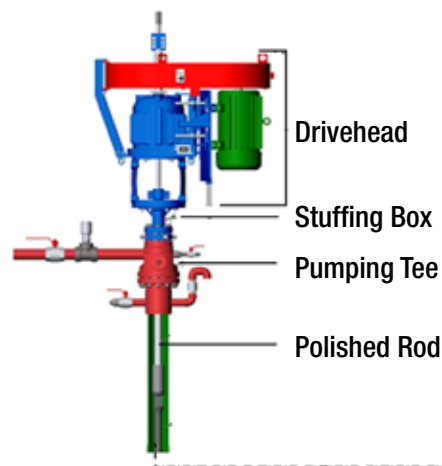
# NOVA PROGRESSIVE CAVITY PUMP

NOVA provides the complete PCP system, including pump rotor/stator, surface drive head/motor, variable speed drive, downhole sensor, and all ancillary components. Rods are optional.

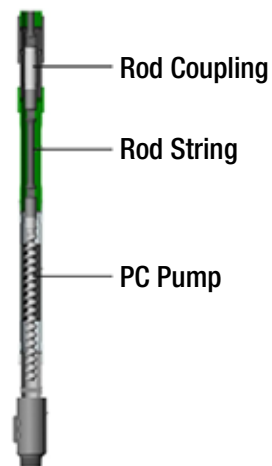
## APPLICATIONS

- Heavy/extra heavy wells with volume range 50-2000 B/D and depths to 1,524 m (5,000 ft)
- Wells up to 1,524 m (5,000 ft) with high viscosity and significant solids
- Shallow to medium depth wells with high sensitivity to energy costs
- Low volume, high viscosity wells up to 2,438.4 m (8,000 ft)
- Able to perform in deviated wells if H<sub>2</sub>O content is low
- CBM well dewatering

### Surface Equipment



### Downhole Equipment



## BENEFITS

- Low capital cost
- High energy efficiency
- Low installation/maintenance cost
- Relatively simple operation
- Environmentally friendly with low profile





**NOVA PETROLEUM**  
S E R V I C E S

# **NOVA ARTIFICIAL LIFTING SYSTEM**

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## **SUCKER ROD PUMP**





## SUCKER ROD PUMP

We are committed to advancing sucker rod pumping performance through technology, innovation, a system engineering approach, and leadership in rod lift optimization and troubleshooting. Our offering remains highly cost effective—ensuring that you benefit from the best-possible lift solution for your application.

To demonstrate our commitment to quality, we maintain applicable API monograms, manufacturing licenses, and third-party certifications across our portfolio of products.

We offer a comprehensive range of pumping units that includes all makes and models, spare parts, and knowledgeable staff who quickly locate exactly what you need. Beam pumping units are available in sizes from API 25 to 1824. The family of NOVA pumping units comprises the following:

Conventional and beam-balanced pumping units conform to API standards and provide reliable, cost-effective performance at a competitive price.



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